

CLAIMS

What is claimed is:

1 1. A slurry composition comprising abrasive particles
2 and an oxidizing agent having a static etch rate on metal of
3 less than 1000 Å per hour; and wherein the pH of the slurry
4 is about 5 to about 11.

1 2. The slurry composition of claim 1 wherein said
2 oxidizing agent is present in the composition in amounts of
3 about 1 g/L to about 100 g/L.

1 3. The slurry composition of claim 1 wherein said
2 abrasive particles are present in the composition in amounts
3 of about 0.2 to about 30% by weight.

1 4. The slurry composition of claim 1 wherein said
2 oxidizing agent is selected from the group consisting of
3 potassium iodate, sodium iodate, ammonium cerium nitrate and
4 potassium ferricyanide.

1 5. The slurry composition of claim 1 wherein said
2 oxidizing agent comprises potassium iodate.

1 6. The slurry composition of claim 1 wherein said
2 oxidizing agent comprises ammonium cerium nitrate.

1 7. The slurry of claim 1 wherein said abrasive
2 particles are selected from the group consisting of alumina,
3 silica, zirconia, ceria, titanium dioxide, ferric oxide and
4 mixtures thereof.

1 8. The slurry of claim 1 wherein said abrasive
2 particles have a particle size of about 10 to about 1000
3 nanometers.

1 9. The slurry of claim 1 wherein said abrasive
2 particles include silica.

1 10. The slurry of claim 9 wherein said silica is fumed
2 silica or colloidal silica.

1 11. The slurry of claim 1 wherein said abrasive
2 particles include ceria.

1 12. The slurry of claim 1 being an aqueous slurry.

1 13. The slurry of claim 10 which further contains an
2 organic diluent.

1 14. The slurry of claim 11 wherein said organic
2 diluent is selected from the group consisting of propylene
3 carbonate, methanol, ethanol, ethylene glycol, glycerol and
4 mixtures thereof.

1 15. The slurry of claim 1 which contains an organic
2 diluent.

1 16. The slurry of claim 13 wherein said organic
2 diluent is selected from the group consisting of propylene
3 carbonate, methanol, ethanol, ethylene glycol, glycerol and
4 mixtures thereof.

1 17. The slurry from claim 1 which further comprises a
2 surfactant.

1 18. The slurry of claim 1 which further comprises at
2 least one polymer selected from the group consisting of
3 polymer of ethylene oxide, polymer of acrylic acid, polymers
4 of acrylamide, polymers of vinyl alcohol, copolymers thereof
5 and mixtures thereof.

1 19. A method for polishing a surface, comprising:
2 providing on said surface a slurry comprising abrasive
3 particles and an oxidizing agent having a static etch rate
4 on metal of less than 1000 Å per hour; and wherein the pH of
5 the slurry is about 6 to about 11;
6 and polishing said surface by contacting it with a
7 polishing pad.

1 20. The method of claim 19 wherein said oxidizing
2 agent is present in the composition in amounts of about 1
3 g/L to about 100 g/L.

1 21. The method of claim 19 wherein said abrasive
2 particles are present in the composition in amounts of about
3 0.2 to about 30% by weight.

1 22. The method of claim 19 wherein said oxidizing
2 agent is selected from the group consisting of potassium
3 iodate, sodium iodate and ammonium cerium nitrate, and
4 potassium ferricyanide.

1 23. The method of claim 19 wherein said oxidizing
2 agent comprises potassium iodate.

1 24. The method of claim 19 wherein said abrasive
2 particles are selected from the group consisting of alumina,

3 silica, zirconia, ceria, titanium dioxide, ferric oxide and
4 mixtures thereof.

1 25. The method of claim 19 wherein said abrasive
2 particles have a particle size of about 10 to about 1000
3 nanometers.

1 26. The method of claim 19 wherein said abrasive
2 particles include silica.

1 27. The method of claim 19 wherein said slurry is an
2 aqueous slurry.

1 28. The method of claim 27 wherein said slurry further
2 contains an organic diluent.

1 29. The method of claim 28 wherein said organic
2 diluent is selected from the group consisting of propylene,
3 carbonate, methanol, ethanol, ethylene glycol, glycerol and
4 mixtures thereof.

1 30. The method of claim 19 wherein said slurry
2 contains an organic diluent.

1 31. The method of claim 30 wherein said organic
2 diluent is selected from the group consisting of propylene
3 carbonate, methanol, ethanol, ethylene glycol, glycerol and
4 mixtures thereof.

1 32. The method of claim 19 which comprises polishing
2 both metal and dielectric material at substantially the same
3 polishing rate.

1 33. The method of claim 32 wherein the ratio of
2 polishing rates of said metal to said dielectric material is
3 about 1:2 to about 2:1.

1 34. The method of claim 19 wherein said polishing
2 involves the step of metal CMP which immediately precedes
3 deposition of the next level dielectric for the purpose of
4 removing scratches or reducing the effects of erosion on
5 dense contact pattern areas or both.

1 35. The method of claim 19 wherein said polishing
2 comprises removing an adhesion promoting or diffusion
3 barrier layer.

1 36. The method of claim 35 wherein said adhesion
2 promoting or diffusion barrier layer is at least one
3 material selected from the group consisting of titanium,
4 titanium nitride, tantalum and tantalum nitride.

1 37. The method of claim 33 wherein said metal is
2 selected from the group consisting of aluminum, copper and
3 tungsten and said dielectric is silicon dioxide.

1 38. The method of claim 19 wherein the speed of said
2 pad during said polishing is about 10 to about 150 rpm, and
3 the speed of the wafer carrier is about 10 to about 150 rpm.